

which passed eastward north of the region of observation, the presence of which was indicated not only by the wind-direction, but also by the low barometric pressure recorded over and near Newfoundland on those dates. On the dates not included in the above-named periods no fog was reported.

Over the ocean south of Nova Scotia fog was reported on the 3d, 29th, and 30th. On the 3d north to west winds and baro-

metric pressure below the normal attended the presence over New Brunswick of an area of low pressure. During the 29th and 30th depression number 15 caused easterly winds and falling barometer in that locality.

Fog was reported off the coasts of Virginia and Maryland on the 27th and 28th, during the prevalence of which high barometer, north to east winds, and rain prevailed.

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

The distribution of mean temperature over the United States and Canada for October, 1887, is exhibited on chart ii by the dotted isothermal lines. In the table of miscellaneous data are given the monthly mean temperatures, with the departures from the normal, for the various stations of the Signal Service. The figures opposite the names of the geographical districts in the columns for mean temperature, precipitation, and departures from the normal, show respectively the averages for the several districts. The normal for any district may be found by adding the departure to the current mean for the district when the departure is below the normal, and subtracting when above. On chart iii the departures from the normal are illustrated by lines connecting stations of normal or equal abnormal values.

The mean temperature is decidedly above the normal in Oregon, California, and the plateau districts, and slightly above the normal in eastern Nova Scotia. The excess over the normal temperature is greatest in northern California, where, at Red Bluff, an unusual departure of 10° occurs. On chart iii the line indicating the region over which the temperature was 4° above the normal encloses nearly all of California and portions of Arizona and Nevada.

In districts east of the Rocky Mountains, except eastern Nova Scotia, the temperature is below the normal, the departures exceeding 2° over nearly all of the region named, while in the Lake region and central valleys they range from 4° to 8°.

The following are some of the most marked departures from the normal precipitation at Signal Service stations where the records cover eight, or more, years:

Above normal.		Below normal.	
Red Bluff, Cal.	10.1	Escanaba, Mich.	8.1
Sacramento, Cal.	6.5	Chicago, Ill.	6.7
Yuma, Ariz.	5.8	Detroit, Mich.	6.5
San Francisco, Cal.	4.9	La Crosse, Wis.	6.7
Winnemucca, Nev.	4.3	Davenport, Iowa.	6.5
Los Angeles, Cal.	3.8	Toledo, Ohio.	5.9
Roseburg, Oregon.	2.7	Saint Paul, Minn.	5.7
San Diego, Cal.	2.5	Dubuque, Iowa.	5.7

RANGES OF TEMPERATURE.

The monthly and the greatest and least daily ranges of temperature at Signal Service stations are given in the tables of miscellaneous meteorological data. The monthly ranges varied from 70° to 100° in the upper Missouri valley and thence westward to Idaho; they were least in southern Florida and on the west Gulf and Pacific coasts.

The following are some of the extremes:

Greatest.		Least.	
Fort Custer, Mont.	100.5	Eureka, Cal.	16.9
Fort Maginnis, Mont.	87.9	Key West, Fla.	19.3
Valentine, Nebr.	84.5	Tatoosh Island, Wash.	19.7
Deadwood, Dak.	81.9	Fort Canby, Wash.	29.9
Poplar River, Mont.	81.7	Brownsville, Tex.	35.2
Saint Vincent, Minn.	81.5	Corpus Christi, Tex.	35.2
Fort Buford, Dak.	80.1	San Diego, Cal.	35.2
Fort Assinaboine, Mont.	79.8	Galveston, Tex.	36.8

The greatest daily range of temperature reported from Signal Service stations was 55° at Bois  City, Idaho; the least, 3°, occurred, at Block Island, R. I., Cape Henry, Va., Vicksburg, Miss., Brownsville, Tex., and Astoria, Oregon.

Table of comparative maximum and minimum temperatures for October.

State or Territory.	Stations.	For 1887.		Since establishment of station.			Length of record.	
		Max.	Min.	Max.	Year.	Min.		Year.
Alabama	Mobile	87.2	34.0	93.4	1884	34.0	1873	17
Do	Montgomery	86.2	32.0	90.1	1884	33.0	1873	16
Arizona	Prescott	85.0	28.8	86.0	1881	18.0	1880	12
Do	Fort Apache	88.0	28.1	86.9	1885	19.0	1880	9
Arkansas	Fort Smith	89.6	32.2	94.6	1884	31.0	1886	6
Do	Little Rock	89.3	33.1	90.0	'81, '83, '84	33.1	1886	9
California	San Francisco	87.0	49.2	84.0	1871	45.0	1881	17
Do	San Diego	85.0	49.8	82.0	1879	44.0	1878	16
Colorado	Denver	85.1	7.8	86.0	1873	1.0	1873	16
Do	Pike's Peak	44.3	0.2	57.3	1886	17.0	1878	14
Connecticut	New Haven	74.7	24.9	86.0	1881	25.1	1886	15
Do	New London	73.3	29.9	82.7	1879	27.2	1883	16
Dakota	Fort Buford	80.4	0.3	95.0	1879	9.0	1881	9
Do	Yankton	80.2	13.3	89.0	1879	9.0	1878	15
Dis. of Columbia	Washington City	85.2	30.9	92.3	1881	26.0	1873	17
Florida	Jacksonville	87.9	40.0	92.0	1883	40.0	1873	17
Do	Key West	86.4	67.1	92.0	1876	65.0	1873	17
Georgia	Atlanta	82.1	30.1	90.8	1884	33.6	1884	10
Do	Savannah	85.0	41.8	92.0	1884	37.0	1873	17
Idaho	Bois� City	87.4	16.4	85.0	1879, 1880	19.0	1878	11
Illinois	Cairo	82.5	27.7	88.0	1872, 1881	24.0	1873	16
Do	Chicago	82.0	14.2	84.0	1879	25.0	1873	16
Indiana	Indianapolis	82.4	22.3	87.0	1884	23.0	1878	15
Indian Ter.	Fort Sill	88.7	30.7	91.0	1878, 1884	44.0	1878	10
Iowa	Dubuque	85.1	14.6	86.0	1879	20.0	1873	14
Do	Des Moines	82.6	13.8	85.8	1884	15.0	1878	10
Kansas	Dodge City	92.4	21.6	90.0	1883	10.0	1878	14
Do	Leavenworth	89.3	23.0	89.0	1871, 1874	19.0	1873	17
Kentucky	Louisville	84.0	25.5	90.0	1884	27.0	1878	16
Louisiana	New Orleans	86.0	41.8	90.0	1884	40.0	1873	17
Do	Shreveport	91.2	37.8	95.0	1883	31.0	1873	15
Maine	Eastport	64.0	26.5	80.0	1879	24.0	1881	14
Do	Portland	69.3	27.9	83.0	1879, 1881	27.6	1886	16
Maryland	Baltimore	85.3	32.2	89.0	1879, 1881	30.0	1873, 1879	16
Massachusetts	Boston	73.1	27.2	90.0	1881	25.0	1879	17
Michigan	Marquette	76.7	12.5	87.0	1879	18.0	1878	14
Do	Grand Haven	76.0	20.2	80.0	1879	23.5	1885	15
Minnesota	Saint Vincent	71.2	10.3	81.6	1886	10.2	1884	8
Do	Saint Paul	72.4	11.5	87	1879	15.0	1878	16
Mississippi	Vicksburg	88.0	33.5	93.7	1886	34.0	1873	16
Missouri	Saint Louis	86.5	24.0	90.0	1879	25.0	1873	17
Montana	Ft. Assinaboine	76.8	30.0	83.0	1884, 1885	16.0	1881	8
Do	Helena	74.2	2.7	76.9	1885	10.0	1881	8
Nebraska	North Platte	85.0	9.1	89.0	1879	11.0	1878	14
Do	Omaha	81.0	15.8	87.0	1879	15.0	1878	15
Nevada	Winnemucca	87.0	17.6	84.0	1879	10.0	1878	9
New Hampshire	Mt. Washington			59.0	1871	3.0	1881	17
New Jersey	Atlantic City	77.0	34.5	83.0	1880	29.0	1879	14
New Mexico	Santa Fe	78.0	31.0	85.0	1878	16.0	1880	13
New York	Buffalo	69.4	24.4	83.0	1879	24.7	1884	15
Do	New York City	78.0	32.0	88.3	1881	31.0	1876	17
North Carolina	Charlotte	83.9	35.5	91.9	1884	30.0	1879	9
Do	Wilmington	85.3	34.8	92.5	1884	32.0	1876	17
Ohio	Cincinnati	81.4	26.1	87.7	1884	27.0	1873	17
Do	Sandusky	85.0	24.0	87.0	1879	30.0	'78, '80, '84	11
Oregon	Portland	75.4	32.9	82.2	1885	31.0	1877	15
Do	Roseburg	82.0	26.5	90.9	1885	22.5	1881	11
Pennsylvania	Pittsburg	80.3	20.0	91.1	1884	28.0	'73, '76, '78	15
Do	Philadelphia	84.2	30.6	87.0	1881	31.0	1873, 1876	17
Rhode Island	Block Island	70.5	36.0	75.4	1881	32.6	1884	8
South Carolina	Charleston	87.7	42.9	93.0	1883	39.0	1873	15
Tennessee	Knoxville	82.0	27.9	94.0	1884	25.0	1876	17
Do	Memphis	88.0	32.6	92.0	1879, 1884	29.0	1878	15
Texas	Brownsville	85.7	50.5	95.0	1877	49.0	1879	11
Do	Fort Elliott	89.3	25.3	88.0	1880	26.0	1880	7
Utah	Salt Lake City	85.2	27.5	83.0	1876	22.0	1878	14
Virginia	Lynchburg	88.2	30.0	91.3	1884	28.0	1879	15
Do	Norfolk	87.0	39.7	89.0	1881, 1884	31.0	1876	17
Washington	Spokane Falls	69.1	12.3	77.0	1886	18.0	1881	7
Do	Olympia	65.7	30.0	73.0	1880	23.0	1881	11
Wisconsin	LaCrosse	82.5	6.2	84.0	1884	18.0	1873	15
Do	Milwaukee	74.3	14.8	83.1	1884	22.0	1878	17
Wyoming	Cheyenne	81.6	4.3	80.0	'73, '74, '79	4.0	1878	13

DEVIATIONS FROM NORMAL TEMPERATURES.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperatures for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for October, 1887; (4) the departures of the current month from the normal;

(5) and the extreme monthly means for October during the period of observations and the year of occurrence:

State and Station.	County.	(1) Normal for the month of Oct.	(2) Length of record.	(3) Mean for October, 1887.	(4) Departure from normal.	(5) Extreme monthly mean temperature for October.			
						Highest.		Lowest.	
						Am't.	Year.	Am't.	Year.
California.			Years						
Sacramento	Sacramento	60.5	21	58.4	-2.1				
Middletown	Middlesex	50.4	29	49.2	-1.2				
New Haven	New Haven	51.4	101	51.1	-0.3				
Waterbury	New Haven	53.2	12	48.0	-5.2				
Florida.									
Archer	Alachua	72.3	5	71.6	-0.7				
Illinois.									
Aurora	Kane	52.4	9	46.2	-6.2				
Goconda	Pope	61.8	9	55.4	-6.4				
Greenville	Bond	57.6	9	50.8	-6.8				
Mattoon	Coles	52.1	8	48.0	-4.1				
Peoria	Peoria	54.0	32	50.4	-3.6				
Riley	McHenry	47.5	28	43.2	-4.3				
Sumner	Lawrence	49.9	7	43.8	-6.1				
Indiana.									
Blue Lick	Clark	58.7	10	52.3	-6.4				
Connersville	Fayette	52.8	6	48.7	-4.1				
Lafayette	Tippecanoe	52.8	8	52.1	-0.7	59.5	1881	42.0	1864
Logansport	Cass	53.2	33	50.2	-3.0				
Sumner	Ripley	53.8	5	51.3	-2.5				
Vevay	Switzerland	56.2	21	52.6	-3.6				
Worthington	Greene	55.8	6	52.6	-3.2				
Iowa.									
Cresco	Howard	46.6	10	41.9	-4.7				
Kansas.									
Independence	Montgomery	58.2	16	54.8	-3.4				
Lawrence	Douglas	54.5	20	52.0	-2.5	60.5	1879	44.0	1866
Wellington	Sumner	56.7	9	56.4	-0.3	60.6	1884	50.3	1880
Yates Centre	Woodson	55.1	7	52.4	-2.7	58.8	1884	50.5	1885
Maine.									
Belfast	Waldo	47.1	28	46.4	-0.7				
Cornish	York	47.7	30	45.1	-2.6	52.6	1879	40.9	1864
Gardiner	Kennebec	47.3	51	46.2	-1.1				
Orono	Penobscot	47.1	19	44.7	-2.4				
Maryland.									
Fallston	Harford	55.4	17	52.9	-2.5	62.2	1879	48.5	1876
Massachusetts.									
Amherst	Hampshire	48.8	50	48.4	-0.4				
Cambridge	Middlesex	50.3	65	50.0	-0.3				
Fitchburg	Worcester	48.3	31	46.6	-1.7				
New Bedford	Bristol	52.1	76	50.3	-1.8				
Somerset	Bristol	53.3	17	52.6	-0.7				
Taunton	Bristol	52.9	16	50.3	-2.6				
Springfield	Hampden	51.2	20	49.9	-1.3				
Nevada.									
Carson City	Ormsby	47.6	8	49.2	+1.6				
New Brunswick.									
Saint Johns	Saint Johns	45.9	27	45.5	-0.4				
New Jersey.									
Dover	Morris	51.9	5	48.5	-3.4				
South Orange	Essex	53.5	18	53.0	-0.5				
New York.									
Factoryville	Tioga	48.6	7	46.1	-2.5				
Humphrey	Cattaraugus	47.4	4	45.2	-2.2	49.2	1886	45.1	1883
Palermo	Oswego	46.9	34	41.9	-5.0	53.9	1879	39.3	1873
Ohio.									
Wauseon	Fulton	51.3	17	46.5	-4.8	59.0	1879	46.0	1875
Pennsylvania.									
Corry	Erie	52.2	7	51.0	-1.2	55.9	1881	48.6	1885
Dyberry	Wayne	44.5	20	46.2	+1.7	53.4	1879	41.8	1869
South Carolina.									
Statburg	Sumter	64.6	7	60.6	-4.0	69.0	1881	59.8	1885
Texas.									
New Ulm	Austiu	69.7	16	67.0	-2.7				
Vermont.									
Lunenburg	Essex	44.7	38	43.6	-1.1				
Newport	Orleans	46.2	12	44.5	-1.7				
Strafford	Orange	47.4	13	45.9	-1.5				
Virginia.									
Bird's Nest	Northampton	61.9	19	61.3	-0.6				
Dale Enterprise	Rockingham					64.7	1883	52.6	1880
Variety Mills	Nelson	57.1	10	52.0	-5.1	67.9	1881	52.0	1885
Wytheville	Wythe	53.7	23	51.2	-2.5				
West Virginia.									
Helvetia	Randolph	52.0	11	48.9	-3.1	56.8	1881	47.0	1885

LOW TEMPERATURES.

Milwaukee, Wis.: the minimum temperature for the month, 15°, occurred on the 25th; this is the lowest temperature that has been recorded here in October since the establishment of the signal office in 1870; the next lowest October temperature, 22°, occurred in 1878.

Clinton, Clinton Co., Iowa: freezing weather prevailed on fifteen days during the month; so great a number of days with freezing temperature has not previously occurred in October during the nine years of record at this station.

FROST.

Frost occurred in the several states and territories during the month as follows:

- 1st.—Oolo., Nebr.
- 2d.—Ind. T., Mont., Nebr., Oregon, Va.
- 3d.—Dak., Mont., Nebr., Nev., Oregon, Va.
- 4th.—Dak., Iowa., Minn., Nebr., Wyo.
- 5th.—Ill., Ind., Iowa., Ky., Minn., Oregon, Pa., Tenn., Wash., Wis.
- 6th.—Dak., Ga. (Forsyth), Minn., Mont., N. C., Ohio, Oregon, Tenn., Va., W. Va.
- 7th.—Cal., Dak., Idaho, Mont., Nev., Oregon, Wash., W. Va., Wyo.
- 8th.—Ariz., Cal., Dak., Idaho, Mont., Nev., Oregon, Wyo.
- 9th.—Ariz., Colo, Dak., Minn., Mont., Nebr., Nev., Oregon, Wyo.
- 10th.—Ariz., Colo., Dak., Iowa, Kans., Mich., Mont., Nebr., Oregon, Utah, Wash., Wyo.
- 11th.—Colo., Dak., Ill., Ind., Ind. T., Iowa, Kans., Ky., Mich., Minn., Mo., Mont., Nebr., Nev., Ohio, Oregon, Tenn., Wash., Wis., Wyo.
- 12th.—Ark. (Fort Smith, Hot Springs, and Lead Hill), Colo., Conn., Del., Ga. (Forsyth), Ill., Ind., Ind. T., Iowa, Kans., Ky., Me., Md., Mass., Mich., Minn., Miss. (University), Mo., Mont., Nebr., N. H., N. J., N. Y., N. C., Ohio, Oregon, Pa., R. I., S. C. (Cedar Springs), Tenn., Wash., W. Va., Wis., Wyo.
- 13th.—Ala. (Livingston), Ariz., Ark. (Lead Hill), Conn., Dak., D. C., Ga. (Atlanta and Forsyth), Ill., Ind., Iowa, Kans., La. (Shreveport), Me., Md., Mass., Mich., Miss. (University and Vicksburg), Mo., Mont., Nebr., N. H., N. J., N. C., Ohio, Oregon, Pa., R. I., Tenn., Va., Wash., W. Va., Wyo.
- 14th.—Ariz, Conn., Dak., D. C., Ill., Ind., Iowa, Kans., Ky., Me., Md., Mass., Mich., Minn., Mont., Nebr., Nev., N. H., N. J., N. Y., N. C., Ohio, Oregon, Pa., R. I., Tenn., Vt., Va., W. Va., Wis., Wyo.
- 15th.—Ariz., Ark. (Lead Hill), Cal., Colo., Conn., Dak., D. C., Ill., Ind., Iowa, Ky., Me., Md., Mass., Mich., Mont., Nev., N. H., N. J., N. Mex., N. Y., N. C., Ohio, Oregon, Pa., R. I., S. C. (Cedar Springs), Tenn., Vt., Va., Wash., W. Va., Wis.
- 16th.—Ariz., Cal., Colo., Conn., Dak., D. C., Ind., Ind. T., Iowa, Ky., Me., Md., Mass., Mich., Minn., Mo., Mont., Nebr., Nev., N. H., N. J., N. Y., N. C., Ohio, Oregon, Pa., R. I., S. C. (Columbia and Cedar Springs), Tenn., Vt., Va., Wash., W. Va., Wis.
- 17th.—Ariz., Colo., Dak., Iowa, Kans., Mass., Md., Minn., Mont., Nebr., Nev., N. H., N. Y., Ohio, Oregon, Pa., Tenn., Utah, Vt., Va., Wash., W. Va., Wis., Wyo.
- 18th.—Ariz., Cal., Colo., Dak., Ill., Iowa, Kans., Ky., Mich., Minn., Mo., Mont., Nebr., Nev., Ohio, Oregon, Utah, Wis.
- 19th.—Ariz., Ark. (Lead Hill), Colo., Ill., Ind., Iowa, Ky., Me., Mich., Mo., Mont., Nev., N. Mex., N. Y., Ohio, Oregon, Pa., Tex., Vt., Wash., Wis.
- 20th.—Ariz., Cal., Colo., Conn., Dak., Ind., Iowa, Kans., Me., Mass., Mich., Mont., Nebr., Nev., N. H., N. J., N. Mex., N. Y., Ohio, Oregon, Pa., Vt., Wash., Wis., Wyo.
- 21st.—Ariz., Ark. (Fort Smith and Lead Hill), Cal., Dak., Ind., Ind. T., Iowa, Kans., Mich., Minn., Mo., Mont., Nebr., Nev., N. Mex., Ohio, Oregon, Tenn., Tex., Va., Wis.
- 22d.—Ark. (Lead Hill), Cal., Colo., Conn., Dak., D. C., Ga. (Atlanta, Augusta, Milledgeville, and Quitman), Ill., Ind., Iowa, Ky., Me., Md., Mich., Minn., Miss. (University), Mo., Mont., Nebr., Nev., N. J., N. Mex., N. Y., N. C., Ohio, Oregon, Pa., S. C. (Charleston, Columbia, and Stateburg), Tenn., Vt., Va., W. V., Wis., Wyo.
- 23d.—Cal., Colo., Conn., Dak., D. C., Idaho, Iowa, Me., Md., Mass., Mich., Mont., Nebr., Nev., N. H., N. J., N. Y., N. C., Ohio, Oregon, Pa., S. C. (Cedar Springs), Tenn., Vt., Va., Wash., W. Va., Wis., Wyo.
- 24th.—Cal., Colo., Dak., Fla. (Jacksonville), Ill., Ind., Ind. T., Iowa, Kans., Mich., Minn., Mo., Mont., Nebr., Nev., Ohio, Oregon, Tenn., Tex., Wash., Wis., Wyo.
- 25th.—Cal., Colo., Dak., Ill., Ind., Ind. T., Iowa, Kans., Me., Mass., Mich., Minn., Mo., Mont., Nebr., Nev., N. Mex., N. Y., Ohio, Oregon, Pa., Tenn., Tex., Vt., Va., Wash., Wis., Wyo.

26th.—Ariz., Cal., Colo., Dak., Ill., Ind., Ind. T., Iowa, Kans., Me., Mass., Mich., Mont., Nebr., Nev., N. H., N. J., N. Y., Ohio, Oregon, Pa., Tenn., Vt., Wis., Wyo.

27th.—Ariz., Cal., Colo., Dak., Ill., Ind. T., Iowa, Kans., Me., Mass., Mich., Minn., Mo., Nebr., Nev., N. Mex., N. C., Ohio, Oregon, Pa., Tenn., Tex., Vt., Wis., Wyo.

28th.—Ariz., Ark. (Fort Smith), Cal., Colo., Dak., Ill., Ind., Ind. T., Iowa, Kans., Mich., Nev., N. Mex., N. Y., Ohio, Oregon, Pa., Tenn., Tex., Wis., Wyo.

29th.—Ariz., Ark. (Lead Hill), Cal., Colo., Dak., Ill., Ind. T., Iowa, Kans., Me., Mass., Mich., Minn., Mo., Mont., Nebr., Nev., N. H., N. Mex., Ohio, Oregon, Pa., Tenn., Tex., Vt., Wis., Wyo.

30th.—Ariz., Ark. (Lead Hill and Little Rock), Cal., Colo., Dak., Ill., Ind., Ind. T., Iowa, Kans., Mass., Mich., Minn., Miss. (Vicksburg), Mo., Mont., Nebr., Nev., N. H., N. Mex., N. Y., Ohio, Oregon, Pa., Tenn., Tex., Vt., Wash., W. Va., Wis.

31st.—Ala. (Livingston, Mobile, and Montgomery), Ariz., Ark. (Lead Hill), Cal., Dak., Fla., (Archer, Jacksonville, Pensacola, and Tallahassee), Ga., (Atlanta, Quitman, and Savannah), Ill., Ind., Ind. T., Iowa, Kans., Ky., La., (Shreveport), Me., Md., Mass., Mich., Minn., Miss. (Biloxi, University, and Vicksburg), Mo., Mont., Nebr., Nev., N. H., N. J., N. Mex., Ohio, Oregon, Pa., Tenn., Tex., Vt., Va., Wash., W. Va., Wis., Wyo.

ICE.

The formation of ice in the southern parts of the country occurred on the following dates :

Ashwood, Tenn., 13th, 22d; Austin, Tenn., 15th, 23d; Charlotte, N. C., 16th; Prescott, Ariz., 20th; Nashville, Tenn., 22d, 31st; Milan, Tenn., 30th, 31st; Quitman and Atlanta, Ga., University of Mississippi, Miss., and Chattanooga, Tenn., 31st.

TEMPERATURE OF WATER.

The following table shows the maximum, minimum, and mean water temperature, as observed at the harbors of the several stations; the monthly range of water temperature; the average depth at which the observations were made, and the mean temperature of the air:

Temperature of water for October, 1887.

Station.	Temperature at bottom.				Mean temperature of air at the station.	Average depth of water in tenths and hundredths
	Max.	Min.	Range.	Monthly mean.		
Canby, Fort, Wash.....	58.1	50.1	8.0	54.3	74.8	53.2
Cedar Keys, Fla.....	75.0	63.3	11.7	70.0	66.0	36.8
Charleston, S. C.....	51.6	48.5	3.1	50.3	46.4	16.5
Eastport, Me.....	80.4	58.4	22.0	70.5	69.4	15.1
Galveston, Tex.....	86.0	72.4	13.6	81.6	78.9	20.3
Key West, Fla.....	63.1	54.2	8.9	59.7	53.1	12.2
New London, Conn.....	62.8	52.9	9.9	58.8	54.7	14.9
New York City.....	77.6	65.6	12.0	73.0	68.2	17.9
Pensacola, Fla.....	54.4	47.1	7.3	51.1	47.6	16.5
Portland, Me.....	61.0	51.2	9.8	56.3	53.8	52.9

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for October, 1887, as determined from the reports of about eight hundred stations, is exhibited on chart iv. In the table of miscellaneous meteorological data are given, for each Signal Service station, the total precipitation, with the departures from the normal. The figures opposite the names of the geographical districts in columns for mean temperature, precipitation, and departures from the normal, show respectively the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal, and subtracting when above.

The precipitation over the greater part of the United States, as compared with the normal, is deficient. The districts where an excess is shown are: Eastern Montana and adjacent portions of Dakota; southern Colorado and northern New Mexico; southeastern Kansas, Indian Territory, and central-northern Texas; the lower Rio Grande Valley; the eastern Gulf and south Atlantic states, except northern Florida; and over the Gulf of Saint Lawrence. An excess of more than one inch over the average precipitation for October occurs in the south Atlantic states. The precipitation in the southern portions of Louisiana and Mississippi is very heavy, the excess at New Orleans amounting to 1.54, and at voluntary stations in southern Mississippi the rainfall is more than double the amount which fell at New Orleans. Over an area extending from southeastern Kansas to central Texas, and in the lower Rio Grande valley, the monthly rainfalls are also exceptionally heavy, the excess at several stations in the regions named amounting to more than two inches. At Brownsville, Tex., the monthly rainfall is 16.27, nearly twelve inches in excess of the October average for the eleven preceding years.

As previously stated, the area of deficiency is much greater than that of excessive rainfall. On the Pacific coast, in the northern and middle plateau districts, and over the entire

region from the Missouri and central Mississippi valleys eastward to the Atlantic coast, the rainfall is decidedly below the average. The precipitation in New England and the lower lake region is about 65 per cent. of the normal, while in the Ohio and upper Mississippi valleys it is less than 50 per cent. Over a large part of California there was an almost entire absence of rainfall during the month, the October average of former years in the northern part of the state being slightly more than an inch, and that for the southern part of the state about four-tenths of an inch. While a deficiency of nearly one inch is shown for the north Pacific coast region (the normal being about 4.50), in the extreme northwestern part of Washington Territory the rainfall is very heavy, Tatoosh Island and Neah Bay reporting 11.83 and 14.84, respectively. This area of heavy rainfall, however, extends but a short distance inland from the coast, as shown by reports from neighboring stations. At Port Angeles, about fifty miles east of Neah Bay, the rainfall is less than three inches, and at Olympia it is but 1.51.

The following are some of the most marked departures from normal precipitation as reported from Signal Service stations:

Above normal.		Below normal.	
	Inches.		Inches.
Brownsville, Tex.....	11.63	Jacksonville, Fla.....	4.42
Charlotte, N. C.....	4.75	Springfield, Ill.....	3.27
Tatoosh Island, Wash.....	4.67	Portland, Oregon.....	3.19
Hatteras, N. C.....	4.55	Des Moines, Iowa.....	3.03
Augusta, Ga.....	4.45	Cedar Keys, Fla.....	2.95
Key West, Fla.....	3.91	Louisville, Ky.....	2.93
Fort Gibson, Ind. T.....	3.30	Cincinnati, Ohio.....	2.91
Cape Henry, Va.....	2.86	Olympia, Wash.....	2.54
Norfolk, Va.....	2.84	Fort Elliott, Tex.....	2.44
Abilene, Tex.....	2.35	Omaha, Nebr.....	2.32

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for a series of years; (2) the length of record during which the observations have been taken, and from which the average has been computed; (3) the total precipitation for October, 1887; (4) the departures of the current month from the average; (5) and the extreme monthly precipitation for October during the period of observations and the year of occurrence: